1101-122 Detection of Ischemia: Multiplane Transesophageal Dobutamine Stress Echocardiography or Perfusion Scintigraphy?

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In non-invasive assessment of ischemia, transthoracic stress echocardiography is well established, however, this technique is not applicable in patients (pts) with poor acoustic windows. It is unknown, whether in these pts multiplane transesophageal stress echocardiography (S-TEE) or perfusion scintigraphy (SPECT) should be preferred.

We studied 52 pts with angina like chest pain by pharmacologic S-TEE (Dobutamine) and SPECT. The results of both methods were compared to coronary angiography (CA). In CA, 30 pts had significant stenosis ≥75% (CA+), 22 pts had no significant stenosis (CA-). On S-TEE, wall motion was evaluated in 16 segments obtained from 3 transgastric and 2 transesophageal views. Ischemia was defined as development of new wall motion abnormalities (WMA) in ≥2 segments. For SPECT, temporary stress induced perfusion defects (SIPD) after maximal bicycle ergometry were considered ischemia.

Results: S-TEE SPECT

	S-TEE		SPECT	
	pos	neg	pos	neg
CA+	27	3	23	7
CA-	5	17	4	18
Sensitivity	90%		77%	
Specificity	77%		82%	
Kappa / p	0.64 / p < 0.001		0.42/p < 0.01	

S-TEE: new WMA (pos), no new WMA (neg) SPECT: SIPD (pos), no SIPD (neg)

Conclusions: Presence or absence of new WMA on S-TEE correlates closely to angiographic findings. The sensitivity in the detection of ischemia with S-TEE is significantly higher compared to SPECT.

1101-123 Pathophysiology of the Biphasic Response Using Simultaneous Dobutamine Echocardiography and Scintigraphy

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Background: The biphasic response seen on dobutamine stress echocardiography (DSE) is associated with a better positive predictive value of subsequent improvement of regional left ventricular (LV) function post-revascularization compared to scintigraphy. The biphasic response is thought to represent reversible ischemia, although data on this is limited.

Methods: We examined the results of 54 patients (mean age 65 ± 9 years, 83% male) with significant LV dysfunction (LVEF < 35%) who underwent simultaneous DSE and sestamibi imaging. The LV was divided into a 16 segment model and scored at rest, low and peak dose dobutamine. Tc99m-sestamibi was injected at peak dose. Of a total of 860 segments, 792 (92%) segments had baseline wall motion abnormalities (WMA): 16.5% mild to moderate, 42.7% severe, 29.2% akinetic, and 29.2% dyskinetic. A biphasic response on DSE was identified by initial improvement in wall motion score (WMS) at low dose dobutamine, followed by subsequent deterioration at peak dose. A monophasic response was identified as continued improvement in WMS, and a nonphasic response as no change in WMS. WMS's were compared to perfusion scores on sestamibi SPECT imaging.

Results:

WMA	Baseline	biphasic	monophasic	nonphasic
mild/mod	142 (16.5%)	56 (39.4%)	54 (38.0%)	11 (7.7%)
Severe	367 (42.7%)	111 (30.2%)	111 (30.2%)	104 (28.3%)
Akinesis	251 (29.2%)	34 (13.5%)	33 (13.1%)	177 (70.5%)
Dyskinesis	32 (3.7%)		2 (6.3%)	
	792	201 (25.4%)	200 (25.3%)	322 (40.7%)
Ischemia by Sestamibi		126 (63%)	129 (65%)	221 (69%)

Conclusions: The biphasic response is more prevalent in mild to moderate and severe regional LV dysfunction. Ischemia by scintigraphy could not differentiate between biphasic, monophasic or nonphasic responses (p = ns). This may explain the limited positive predictive value of scintigraphy.

1101-124 Role of Stress/rest Myocardial Perfusion Tomoscintigraphy, Dipyridamole and Dobutamine Stress Echocardiography in the Evaluation of Hypertensive Patients With Chest Pain and Positive Exercise Test

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Patients (pts) with systemic hypertension (SH) frequently complain of chest pain and exhibit a positive exercise ECG despite a normal coronary angiogram (NCA). To better characterize these pts, different diagnostic tools have been suggested, including perfusion and echocardiographic stress studies. In order to evaluate their relative diagnostic accuracies we performed stress/rest myocardial perfusion SPECT (MPS) with 99mTc-MIBI, dipyridamole (dip) (0.56 mg/kg/4' + 0.28 mg/kg/2') and dobutamine (dob) (up to 40 μg/kg/min) stress echocardiography (SE) and coronary angiography in 90 pts (age 60 ± 4 yrs, 47 females) with SH, chest pain and positive exercise ECG. All pts had normal resting left ventricular function and 51 had left ventricular hypertrophy (LVH) (septum 12.7 ± 1.9 mm). All were kept on ACE-inhibitors during the study period. SE and MPS images were interpreted by three experienced observers unaware of clinical data. Scintigraphic images were considered abnormal when MIBI uptake was < 25% of the segment with the greatest uptake in at least 2 adjacent tomographic slices. A SE test was considered positive when inducing definite wall motion abnormalities (WMA). Significant coronary artery disease (CAD) was defined as a ≥ 50% stenosis in at least one major epicardial artery. Only 50 pts exhibited significant CAD, confirming the poor specificity of the exercise ECG in hypertensive pts. The results were as follows:

	MPS	DipSE	DobSE
Sensitivity (%)	92	59	86
Specificity (%)	69	92	81
Accuracy (%)	80	78	83
Positive Predictive value (%)	52	84	76
Negative predictive value (%)	84	75	89

The results show that dob SE is safe in pts with SH and is probably the test of choice for detecting underlying CAD. The low specificity of MPS probably relates to the fact that this method traces perfusion abnormalities, not necessarily caused by epicardial CAD. It is likely that these abnormalities are the result of localized subendocardial underperfusion, possibly due to microvascular dysfunction and not necessarily causing obviates WMA.

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1102-137 Longitudinal, Phased-Array Intracardiac Ultrasound Guidance of Transseptal Catheterization

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Because of the inherent limitations of fluoroscopic guidance of transseptal sheath placement, the utility of a new phased-array, linear longitudinal ultrasound imaging system for guiding transseptal catheterization was assessed during 40 transseptal crossing attempts in 18 dogs. Intracardiac ultrasound imaging from the right atrium at the level of the tricuspid valve annulus provided high quality images of the membranous fossa ovalis, right pulmonary veins, left atrium, and left atrial appendage in each case. Ultrasound readily identified contact of the Brockenbraugh needle with the interatrial septum as evidenced by membranous fossa ovalis indentation or "tenting." With actual transseptal crossing, advancement of the dilator, or sheath was adequately imaged in each case. Transseptal catheterization was successfully accomplished in 18/18 dogs: on the first attempt in 14 and on the second attempt in 3. Successful left-sided access was confirmed by agitated saline contrast injection via the sheath. Total catheterization time was 3.2 ± 1.9 min. Unsuccessful first attempts and subsequent sheath pullbacks into the right atrium with catheter manipulation were also readily identified. In 2 attempts, insertion of the transseptal needle beyond the ultrasound imaging plane resulted in perforation of the posterior left atrial wall. Accompanying effusions were readily identified and monitored echocardiographically. Based on this information, we conclude that this new intracardiac imaging provides a highly reliable means of guiding transseptal access to the left atrium. Nevertheless, despite excellent anatomic visualization, residual perforation risk warrants continued caution in performing this procedure.